

**MAGNETIC RECORDING DISK DRIVE WITH ACTIVELY  
CONTROLLED ELECTRIC POTENTIAL AT THE HEAD/DISK  
INTERFACE FOR WEAR AND DURABILITY CONTROL**

**ABSTRACT OF THE DISCLOSURE**

An electrical potential difference between a slider body and a hard disk of a hard disk drive is eliminated based on the flying-height spacing of the slider body between the slider body and the hard disk. A predetermined bias voltage is applied between the slider body and the hard disk that includes a DC component and an AC component and that is based on the detected flying-height spacing of the slider body. The flying-height spacing can be detected based a minimum slider-to-disk clearance change from a design flying height of the slider at a frequency of the AC component as the DC component of the predetermined bias voltage is varied. Alternatively, the flying-height spacing can be detected based on a minimum electrodynamic response of the slider to a first harmonic of the AC frequency of the AC component as the DC component is varied.